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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/521,280	03/07/2000	Stephan Voges	EFIM0252	9230

31408 7590 01/21/2005

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EXAMINER	
KISS, ERIC B	

ART UNIT	PAPER NUMBER
2122	

DATE MAILED: 01/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/521,280	VOGES ET AL.	
	Examiner	Art Unit	
	Eric B. Kiss	2122	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondenc address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 September 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,5 and 55-58* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,5 and 55-58* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. The reply filed 29 September 2004 has been received and entered. Claims 1, 5, and 55-58 are pending.

Response to Arguments

2. Applicant's arguments filed 29 September 2004 have been fully considered but they are not persuasive.

a. In response to Applicant's arguments on pages 4-5, with respect to the rejection of claims 1 and 5 under 35 U.S.C. §102(b), the Examiner respectfully submits that claim 1, as amended, can be read as requiring "one or more scripted routines within a single executable program". The claim does not necessarily require that the simulation engine **and** the scripted routines reside within a single executable program. Further, the Examiner is unable to find the support required by 35 U.S.C. §112 within the originally filed specification for such an interpretation. Accordingly, the claim is interpreted as requiring a single executable program to store one or more scripted routines.

Applicant has acknowledged that the *Steinmetz, Jr.* reference discloses the test script means being an executing computer program. Further, *Steinmetz, Jr.* discloses a sample test script source code file (in columns 20-22) that clearly contains several scripted routines. As is disclosed in col. 12, lines 36-43, of *Steinmetz, Jr.*,

> Each of the test script and PLI programs 303, 305 is compiled, using the C compiler 309. During compilation, the common library of functions 301 will be accessed, and object code corresponding to invoked functions will be retrieved for

incorporation into the object code that embodies the runnable test script program 311 and the runnable simulation environment program 313.

Therefore, the Examiner maintains that *Steinmetz, Jr.* meets the limitations of claim 1, as amended.

Applicant's suggestion that *Steinmetz, Jr.*, "in fact, distinctly points away from the claimed invention," is wholly unpersuasive.

b. Applicant's argument with regard to the new limitation added by amendment to claim 55 is moot in view of the new ground of rejection set forth below, as necessitated by Applicant's amendment.

Claim Rejections - 35 USC § 102

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 1, 5, and 57 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,600,579 to Steinmetz, Jr.

As per claim 1, *Steinmetz, Jr.* discloses partitioning functionality of a test bench (hardware design verification system) between a simulation engine (simulator means) and one or more scripted routines within a single executable program (test script), wherein each scripted routing implements a corresponding function (scripting means; see column 3, lines 3-19 and Fig. 1); instantiating one or more interpreters in the simulation engine, wherein each interpreter is

associated with a corresponding scripted routine and may interact with the simulation engine independently of any other interpreter (see column 8, line 13 through column 9, line 22); causing the simulation engine to pass control to the corresponding interpreter upon encountering one of the functions (see, for example, column 22, lines 47-60; and column 12, lines 8-53); and causing the corresponding interpreter to return control to the simulation engine upon encountering a task that is performed by the simulation engine (see, for example, column 11, line 52 through column 12, line 4; and column 20, lines 28-40).

As per claim 5, *Steinmetz, Jr.* further discloses synchronizing the simulation and interpreter using a semaphore (acknowledgement command word; see column 23, lines 30-39).

As per claim 57, *Steinmetz, Jr.* further discloses directly sharing variables between the simulation engine and the one or more scripted routines (see, for example, the format of socket packets described in col. 9, line 25, through col. 12, line 4).

Claim Rejections - 35 USC § 103

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. Claims 55 and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,600,579 to Steinmetz, Jr. in view of Hansen Dai and Bill Paulsen, "Multithreading VHDL Simulation," 1994 (hereinafter *Dai/Paulsen*).

As per claim 55, *Steinmetz, Jr.* discloses partitioning functionality of a test bench (hardware design verification system) between a simulation engine (simulator means) and one or more scripted routines, wherein each scripted routing implements a corresponding function (scripting means; see column 3, lines 3-19 and Fig. 1); instantiating one or more interpreters in the simulation engine, wherein each interpreter is associated with a corresponding scripted routine and may interact with the simulation engine independently of any other interpreter (see column 8, line 13 through column 9, line 22); causing the simulation engine to pass control to the corresponding interpreter upon encountering one of the functions (see, for example, column 22, lines 47-60; and column 12, lines 8-53); and causing the corresponding interpreter to return control to the simulation engine upon encountering a task that is performed by the simulation engine (see, for example, column 11, line 52 through column 12, line 4; and column 20, lines 28-40).

Steinmetz, Jr. fails to expressly disclose using multiple threads to partition the functionality of the test bench while maintaining a single-threaded nature of simulation. However, *Dai/Paulsen* teaches the use of multithread processing within a VHDL test bench (see, for example, section 3.2 on page 4.35). *Dai/Paulsen* further teaches maintaining a single-threaded nature of simulation (see, for example, the descriptions of the "barrier" and "spin lock" in section 3.2 on page 4.35). Therefore, it would have been obvious to one of ordinary skill in the computer art at the time the invention was made to modify the method of *Steinmetz, Jr.* to include the use of multiple threads in partitioning the functionality of the test bench while maintaining a single-threaded nature of simulation. One would be motivated to do so to take advantage of inherent parallelism and speed up simulation.

As per claim 56, *Steinmetz, Jr.* further discloses synchronizing the simulation and interpreter using a semaphore (acknowledgement command word; see column 23, lines 30-39). Therefore, for reasons stated above, such a claim also would have been obvious.

As per claim 58, *Steinmetz, Jr.* further discloses directly sharing variables between the simulation engine and the one or more scripted routines (see, for example, the format of socket packets described in col. 9, line 25, through col. 12, line 4). Therefore, for reasons stated above, such a claim also would have been obvious.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure.

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Eric B. Kiss whose telephone number is (571) 272-3699. The Examiner can normally be reached on Tue. - Fri., 7:00 am - 4:30 pm. The Examiner can also be reached on alternate Mondays.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Tuan Dam, can be reached on (571) 272-3695. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

EBK/EBK
January 13, 2005

TUAN DAM
SUPERVISORY PATENT EXAMINER